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Spawn Composition on the Sporophore Yield of Oyster mushroom*

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Studies on the influence of spawn composition viz., nitrogen, phosphorus, potassium, calcium, magnesium, total phenolics, *ortho*-dihydroxy phenolics and reducing sugars on the sporophore yield of oyster mushroom (*Pleurotus sajor-caju* (Fr.) Singer) were made. There was a significantly negative relationship between yield and nitrogen content of of grains used for spawn preparation. The other constituents of grain did not have any correlation with yield.

Pleurotus sajor-caju (Fr.) Singer, oyster mushroom is a well known edible fungus. The success of mushroom cultivation and its yield depends to a large extent on the quality of the spawn used. Aiming at good yield, different materials were tested as the spawn base. Sorghum (*Sorghum vulgare*) and bajra (*Pennisetum typhoides*) grain spawns were found to give significantly higher yields than spawn from other grains (Sivaprakasam, 1980). Since there were variations in the yield potentials among the grains used for spawn preparation, further studies were made to find out the factors responsible for the difference in productivity of various spawn bases. The result of investigation are presented in this paper.

MATERIAL AND METHODS

Attempts were made to correlate the yield of sporophores obtained with the use of different grain spawns (Y) and the constituents of grain viz., nitrogen (X_1), phosphorus (X_2), potassium (X_3), calcium (X_4), magnesium(X_5), total phenolics (X_6) *ortho*-dihydroxy phenolics (X_7) and reducing sugars (X_8) contents. Estimations were carried out following micro - kjeldahl's method for total nitrogen, vanado-molybdate method for phosphorus, Flame photometric method for potassium and versenate titration method for calcium and magnesium (Jackson, 1973). Total phenolics and *ortho*-dihydroxy phenolics were estimated by the methods of Bray and Thorpe (1954) and Johnson and Schaal (1957) respectively. Reducing sugars were estimated by the method of Nelson (1944). Correlations were done to find out the relative contribution of each constituent.

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RESULTS AND DISCUSSION

There was a significantly negative relationship between yield and nitrogen content of grains [Table 1 and 2]. The other constituents of grain did not have any correlation with yield.

In general the present study revealed a little relevance of the constituents of the grain used as spawn base on the sporophore yield. The N contents of the spawn base however influenced negatively the yield of sporophore. The negative association of N content with sporophore yield may be due to the inhibition of fungal growth at higher levels (Brock, 1251; Jandaik and Kapoor, 1976). Addition of nitrogen decreased the mycelial growth as well as yield of *P. flabellatus* (Zakia, 1967, 1972) C : N ratio of the spawn base has been reported to have no direct relationship but the C:N to starch ratio has been found to be important. Very narrow C : N to starch ratio increased the yield whereas wider ratio drastically reduced the yield (Ramasamy and Kandaswamy, 1976). The spawn medium containing low C : N ratio and high starch such as grain which resulted in narrow C : N to starch ratio gave good yields in the present investigation also. Thus, increased N content of the growth to the spawn base might alter C : N to starch ratio unfavourable to the growth to the mushroom fungus.

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Table 1 Constituents of grains used fot spawn preparation in relation to sporophore yield

Grains	Yield of sporophore	Constituents of grain (dry weight basis)							
		Nitrogen	Phosphorus	Potassium	Calciam	Magnesium	Total-phenolics (ug/g)	ortho-dihydroxy phenolics (ug/g)	Reducing sugars (ug/g)
	(Y)	(X_1)	(X_2)	(X_3)	(X_4)	(X_5)	(X_6)	(X_7)	(X_8)
Sorghum (*Sorghum vulgare* (L.) Moench)	192.3	(7.71)	(3.47)	(2.83)	(5.73)	(4.63)	305	50	350
Bajra (*Pennisetum typhoides* stapf & Hubb.)	188.3	(7.56)	(3.64)	(2.50)	(4.43)	(3.42)	300	55	105
Maize (*Zea mays* L.)	164.0	(8.12)	(3.73)	(3.00)	(6.80)	(3.42)	300	80	375
Paniveragu (*Panicum milliaceum* L.)	125.0	(7.49)	(3.59)	(2.06)	(5.72)	(3.91)	225	60	170
Kudiraivali (*Echinochloa frumentacea* L.)	98.0	(9.10)	(2.81)	(2.06)	(5.72)	(3.42)	168	50	175
Tenai (*Setaria italica* Beauv.)	72.6	(9.63)	(3.06)	(2.83)	(4.43)	(3.96)	135	55	110
Varagu (*Paspalum scrobiculatum* L.)	59.3	(8.91)	(2.50)	(2.55)	(6.28)	(3.42)	470	100	410

X_1, X_2, X_3, X_4, and X_5 in transformed values

Table 2. Correlation matrix of sporophore yield of grain spawn with constituents of grains

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
Y (Sporophore yield)	-0.793**	0 348	0 159	-0.161	0.177	0.051	-0.397	0.035
X_1 (Nirogen consent)		-0.408	0.079	-0.101	-0.156	-0 268	-0.119	-0.091
X_2 (Phosphorus content)			0.035	0.778	0.157	-0.059	-0.084	-0.023
X_3 (Potassium content)				0.234	0.280	0.153	0.162	0.255
X_4 (Calcium content)					-0.201	0 436*	0.538**	0.775**
X_5 (Magnesium content)						-0.101	-0.242	0.009
X_6 (Total phenolics content)							0.774**	0.740**
x_7 (*ortho*-dihydroxy phenolics content)								
x_8 (Reducing sugars content)								0.678**

* Significant at 5%; ** Significant at 1%